TECHNICAL REVIEW DOCUMENT
For
OPERATING PERMIT 17OPJA401

SandRidge Exploration and Production – Bighorn Pad
Jackson County
Source ID 0570051

September 2017 – January 1, 2020

Operating Permit Engineer:	Conor Whetsel
Operating Permit Supervisor review:	Blue Parish
Field Services Oil and Gas Unit review:	Joseph Wright

I. Purpose

This document establishes the basis for decisions made regarding the applicable requirements, emission factors, monitoring plan and compliance status of emission units covered by the Operating Permit for the Bighorn Pad.

This document is designed for reference during the review of the proposed permit by the EPA, the public, and other interested parties. The conclusions made in this report are based on information provided in the original application submitted on September 19, 2017, comments on the draft permit submitted on April 4, 2019, previous inspection reports and various email correspondence, as well as telephone conversations with the applicant. Please note that copies of the Technical Review Document for the original permit and any Technical Review Documents associated with subsequent modifications of the original Operating Permit may be found in the Division files as well as on the Division website at www.colorado.gov/cdphe/airTitleV. This narrative is intended only as an adjunct for the reviewer and has no legal standing.

Any revisions made to the underlying construction permits associated with this facility made in conjunction with the processing of this operating permit application have been reviewed in accordance with the requirements of Regulation No. 3, Part B, Construction Permits, and have been found to meet all applicable substantive and procedural requirements. This operating permit incorporates and shall be considered to be a combined construction/operating permit for any such revision, and the permittee shall be allowed to operate under the revised conditions upon issuance of this operating permit without applying for a revision to this permit or for an additional or revised construction permit.

II. Description of Source

The Bighorn Pad is a multi-well oil and gas production facility, which produces sweet gas, crude oil, and produced water from eight wells. Currently the commingled stream flows from the wellhead unassisted. The production stream flows from the wellheads to two heater-treaters.

From the heater-treater, the crude oil phase is directed to fifteen 1,100-bbl crude oil storage tanks. The water phase is piped to six 1,100-bbl produced water storage tanks. Hydrocarbon vapors are sent from the crude oil and produced water tanks to a smokeless combustor with a minimum destruction efficiency of 98 percent. All the natural gas from the heater-treater is currently being routed to a combustor and controlled by 98 percent. The separator gas and the storage tank vapors are controlled by the same enclosed combustion device. Crude oil and produced water are trucked out of the facility using tank trucks and submerged fill loading.

The Bighorn Pad is located in Jackson County, Colorado, approximately 13 miles south of Walden, CO in the NWNW of Section 17, Township 7N, Range 80W. Wyoming is the only affected state within 50 miles of the facility. The following Federal Class I designated areas are within 100 kilometers of the facility: Flat Tops Wilderness Area, Mount Zirkel Wilderness Area, Rawah Wilderness Area, and Rocky Mountain National Park.

This facility is located in an area designated attainment for all pollutants. Based on the information provided by the applicant, this source is categorized as a synthetic minor stationary source for PSD as of the issue date of this permit. Any future modification which is major by itself (Potential to Emit of ≥ 250 TPY) for any pollutant listed in Regulation No. 3, Part D, Section II.A.44 for which the area is in attainment or attainment/maintenance may result in the application of the PSD review requirements.

Emissions (in tons/yr) at the facility are as follows:

Pollutant	Potential to Emit (tpy)	Actual Emissions (tpy)
$PM_{2.5}$	2.3	N/A
NO_X	34.2	26.1
VOC	237.1	204.9
CO	155.3	118.8
Highest HAP (n-Hexane)	4.0	3.4
Total HAP	5.2	4.1

Potential to Emit (PTE) is based on permitted emission levels which include controls. Actual emissions are from APENs submitted to the Division on March 16, 2018 and the Division's Inventory System for the year 2017.

III. Applicable Requirements

Accidental Release Program – 112(r)

Section 112(r) of the Clean Air Act mandates a new federal focus on the prevention of chemical accidents. Sources subject to these provisions must develop and implement risk management programs that include hazard assessment, a prevention program, and an emergency response program. They must prepare and implement a Risk Management Plan (RMP) as specified in the Rule

Based on the information provided by the applicant, this facility is not subject to the provisions of the Accidental Release Prevention Program (Section 112(r) of the Federal Clean Air Act).

Compliance Assurance Monitoring (CAM)

The following emission points at this facility use a control device to achieve compliance with an emission limitation or standard to which they are subject and have pre-control emissions that exceed or are equivalent to the major source threshold. They are therefore subject to the provisions of the CAM program as set forth in 40 CFR Part 64 as adopted by reference into Colorado Regulation No. 3, Part C, Section XIV:

Point 001 (Crude Oil Tanks) for VOCs.

Point 002 (Emission unit Flare-1) for VOCs.

Point 003 (PW Tanks) has pre-control emissions of VOC that exceed major source thresholds. The tanks are not large pollutant specific emission units (i.e. potential controlled emissions, including limits, are less than major source thresholds), therefore the applicant is not required to submit a CAM plan until the permit is renewed (if applicable).

Hazardous Air Pollutants (HAPs)

The facility is a synthetic minor source of HAP with respect to Title V Operating Permit thresholds.

Source Determination

With this permit action, the Division revisited the source determination in regards to the natural gas operations in the area surrounding the Bighorn Pad to verify that the proper pollutant emitting activities are included in this permit as part of the Bighorn Pad. The applicant did not identify any other pollutant emitting activities in the vicinity of the Bighorn Pad on that are dependent upon the Bighorn Pad to maintain operations. The Division considers the current determination for this facility to be accurate, and the proper pollutant emitting activities are included in this permit.

Colorado Regulation No. 7, Sections XII

Section XII for Volatile Organic Compound Emissions from Oil and Gas Operations is not applicable to any part of this facility because Bighorn Pad is not located in an Ozone Nonattainment Area.

Colorado Regulation No. 7, Section XVII Requirements for Storage Tanks at Oil and Gas Exploration and Production Operations, Well Production Facilities, Natural Gas Compressor Stations, and Natural Gas Processing Plants

Section XVII.C requires atmospheric storage tanks with uncontrolled actual emissions of VOCs equal to or greater than six (6) tons per year based on a rolling twelve-month total must operate air pollution control equipment that achieves an average hydrocarbon control efficiency of 95%, and The associated flares must have a design destruction efficiency of at least 98% for hydrocarbons. Based on permitted throughputs, uncontrolled VOC emissions from the tank battery (Based on BR&E ProMax emissions modelling) are greater than 6 tpy and Section XVII.C applies.

Section XII.C does not specify a compliance schedule for inspections of tanks with actual uncontrolled emissions below control thresholds that subsequently increase emissions above control thresholds; language was added to require inspections within 30 days of discovery of the emission increase, or at the time that the next inspection was scheduled as per the previous inspection frequency, whichever occurs first.

Section XII.C requires STEM plans to be updated "as necessary" but does not include a requirement to review the plans on a regular basis; a requirement to conduct an annual review was added.

Colorado Regulation No. 7, Section XVII Requirements for Well Production Facilities

Section XVII.G requires gas coming off a separator, produced during normal operation from any newly constructed, hydraulically fractured, or recompleted oil and gas well, must either be routed to a gas gathering line or controlled from the date of first production by air pollution control equipment that achieves an average hydrocarbon control efficiency of 95%. If a combustion device is used, it must have a design destruction efficiency of at least 98% for hydrocarbons. Bighorn Pad has a combustion device controlling emissions from the separators and is subject to the requirements of Section XVII.G.

Colorado Regulation No. 7, Section XVII Requirements for Leak detection and repair program for well production facilities and natural gas compressor stations

Bighorn Pad is a well production facility and therefore is subject to the applicable leak detection requirements of Section XVII.F.

Colorado Regulation No. 7, Section XVIII Requirements for Natural Gas-Actuated Pneumatic Controllers Associated with Oil and Gas Operations

Section XVIII applies to pneumatic controllers that are actuated by natural gas, and located at, or upstream of natural gas processing plants (upstream activities include: oil and gas exploration and production operations and natural gas compressor stations). All of the natural gas-actuated pneumatic controllers at Bighorn Pad are either "no-bleed" (not using hydrocarbon gas as the valve's actuating gas) or "low-bleed" (designed to have a continuous bleed rate that emits less than or equal to 6 scfh of natural gas to the atmosphere), which are all subject to the applicable requirements in Section XVIII.

40 CFR 60 Subpart Kb - Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984

Subpart Kb includes requirements for storage vessels with a capacity greater than or equal to 75 cubic meters (472 bbls) used for the storage of volatile organic liquids. However, Subpart Kb is not applicable to vessels with a design capacity less than or equal to 1,589.874 cubic meters used for petroleum or condensate stored, processed, or treated prior to custody transfer (§60.110b(d)). Each storage tank on site is less than 1,589.874 cubic meters (10,000 bbls) and is used for petroleum or condensate

stored, processed, or treated prior to custody transfer, therefore Bighorn Pad is not subject to the requirements of Subpart Kb.

40 CFR 60 Subpart KKK - Standards of Performance for Equipment Leaks of VOC From Onshore Natural Gas Processing Plants for Which Construction, Reconstruction, or Modification Commenced After January 20, 1984, and on or Before August 23, 2011

Subpart KKK applies to VOC emissions from equipment leaks at onshore natural gas processing plants. Natural gas processing plant (gas plant) means any processing site engaged in the extraction of natural gas liquids from field gas, fractionation of mixed natural gas liquids to natural gas products, or both (§60.631). Bighorn Pad does not extract natural gas liquids from field gas, therefore the facility is not subject to the requirements in Subpart KKK.

40 CFR 60 Subpart OOOO - Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification or Reconstruction Commenced After August 23, 2011, and on or before September 18, 2015

Subpart OOOO requirements apply to affected facilities that were constructed, modified, or reconstructed after August 23, 2011, and prior to September 18, 2015. Bighorn Pad was constructed after September 18, 2015, therefore Subpart OOOO does not apply to this facility.

40 CFR 60 Subpart OOOOa - Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015

Subpart OOOOa applies to onshore affected facilities that were constructed, modified, or reconstructed after September 18, 2015. Bighorn Pad is an affected facility under Subpart OOOOa as it is a well affected facility (§60.5365a(a)), a pneumatic controller affected facility (§60.5365a(d)), a storage vessel affected facility (§60.5365a(e)), a a pneumatic pump affected facility (§60.5365a(h)), the collection of fugitive emission components is an affected facility (§60.5365a(i)). The Crude Oil Tanks at Bighorn Pad are controlled by an enclosed flare and have post control emissions greater than or equal to six (6) tons per year, therefore Bighorn Pad is subject to the storage tanks requirements in Subpart OOOOa. Bighorn Pad is an affected facility which is the collection of fugitive emissions components at a well site is subject to the requirements of Subpart OOOOa. Because the crude oil throughput can be shared between all the tanks, any combination of tanks, or a single tank, the emissions were not divided evenly among all tanks. Instead, it was assumed that the throughput could pass through any one single tank, and therefore the crude oil tanks are subject to OOOOa based on the post-control six (6) tons per year of VOC emissions.

40 CFR 63 Subpart H - National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks

The provisions of Subpart H apply to pumps, compressors, agitators, pressure relief devices, sampling connection systems, open-ended valves or lines, valves,

connectors, surge control vessels, bottoms receivers, instrumentation systems, and control devices or closed vent systems required by this subpart that are intended to operate in organic hazardous air pollutant service 300 hours or more during the calendar year in service at facilities which are major sources for HAPs. Bighorn Pad's HAP emissions are less than major source thresholds (10 tpy for individual HAPs and 25 tpy for total HAPs), therefore the requirements of Subpart H are not applicable to Bighorn Pad.

40 CFR 63 Subpart H – National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities

Subpart HH applies to major and area sources of HAPs. At area sources of HAPs, TEG dehydration units are the only emission sources subject to the requirements of this regulation. Bighorn Pad is an area source of HAPs and does not include any TEG dehydration units on site. Therefore, none of the equipment at Bighorn Pad is subject to the requirements of Subpart HH.

40 CFR 63 Subpart HHH - National Emission Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities

Subpart HHH requirements are applicable to the owners and operators of natural gas transmission and storage facilities that transport and store natural gas prior to entering the pipeline to a local distribution company or to a final end user (if there is no local distribution company), and that are major sources of hazardous air pollutants (HAP) emissions as defined in §63.1271. Bighorn Pad is not a major source for HAPs, and doesn't contain an affected source, as specified in paragraph §63.1270(b), and therefore is not subject to the requirements of this subpart (§63.1270(c)).

40 CFR 63 Subpart JJJJJJ - National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources

Subpart JJJJJJ does not classify process heaters as boilers, therefore, Bighorn Pad does not have any boilers on site and is not subject to the requirements of Subpart JJJJJJ.

IV. Emission Sources

A. Crude Oil Tanks: Twenty-five (25) 1,100 barrel Fixed Roof Storage Vessels used to Store Crude Oil, Controlled with a Zeeco EGF-7-40 Enclosed Combustor and an Emergency Backup Open Flare (AIRS ID: 001)

1. Applicable Requirements

According to the Title V permit application, the Crude Oil Tanks commenced operation on June 23, 2016.

The due date of the first semi-annual monitoring report required by this operating permit will be more than 180 days after the initial approval construction permit 16JA1055 was issued and/or the equipment commenced operation. Therefore, under the provisions of Regulation No. 3, Part C, Section V.A.2, the Division is allowing the initial approval construction permit to continue in full force and effect

and will consider the Responsible Official certification submitted with that report to serve as the demonstration required pursuant to Regulation No. 3, Part B, Section III.G.2 and no final approval construction permit will be issued. The appropriate provisions of the initial approval construction permit have been directly incorporated into this operating permit

The appropriate applicable requirements from Colorado Construction Permit 16JA1055 for the Crude Oil Tanks are included in the OP as follows:

- Condition 1 – Self-Certification Requirements

  Not Included: Condition is fulfilled through compliance with Regulation No. 7 requirements.

- Condition 2 – the construction permit issuance represents final approval to operate

  Not Included: this condition is informational and has no specific requirements

- Condition 3 – Emission Limits

  Included

- Condition 4 – Requirements to operate/maintain control equipment

  Not included: the operating permit includes more specific requirements for the operation, monitoring and maintenance of all control equipment

- Condition 5 – Process Limits

  Included

- Condition 6 – Requirement to follow Operation & Maintenance Plan for calculating emissions.

  Not Included: Emission calculation methodology was modified based on monitoring and recordkeeping requirements.

- Condition 7 – Requirement to monitor and record heater treater throughput

  Not Included: Condition is applicable to Point 002, and not applicable to the Crude Oil Tanks.

- Condition 8 – Loadout submerged fill requirement

  Not Included: Condition is applicable to Point 004, and not applicable to the Crude Oil Tanks.

- Condition 9 – Opacity requirement

  Included: additional language to monitor compliance was also included.

- Condition 10 – Regulation No. 2 odor requirements

  Not included: these requirements are addressed in the general requirements section of the operating permit as applicable

- Condition 11 – mark equipment with identifying info

  Not included: one-time requirement has been met

- Conditions 12 – Colorado Regulation No. 7 requirements for combustion devices

  Included

- Conditions 13 and 14 – Colorado Regulation No. 7 requirements for storage tanks

  Included

- Condition 15 – Colorado Regulation No. 7 requirements for alternative emissions control devices

  Included

- Condition 16 – Colorado Regulation No. 7 requirements for well production facilities

  Not Included: Condition is applicable to Point 002, and not applicable to the Crude Oil Tanks.

- Condition 17 – Requirement to minimize leaks form loading operations

  Not Included: Condition is applicable to Point 004, and not applicable to the Crude Oil Tanks.

- Condition 18 – Colorado Regulation No. 3 requirements for loading procedures

  Not Included: Condition is applicable to Point 004, and not applicable to the Crude Oil Tanks.

- Condition 19 – Colorado Regulation No. 3 requirements to minimize leakage of VOCs

  Not Included: Condition is applicable to Point 004, and not applicable to the Crude Oil Tanks.

- Condition 20 – Requirement to submit/follow Operating & Maintenance Plan

  Not included: Monitoring and maintenance requirements are incorporated directly in the operating permit

- Condition 21 – Initial Testing Requirement(s) for opacity

Included: Included in the Regulation No. 7, Section XVII requirements, but not as an initial testing requirement.

- Condition 22 – Periodic Testing Requirement(s) for compliance emission test

  Included

- Condition 23 – Periodic Testing Requirement(s) for compliance emission test

  Not Included: Condition is applicable to Point 002, and not applicable to the Crude Oil Tanks.

- Condition 24 – Periodic Testing Requirement(s) for gas analysis

  Not Included: Condition is applicable to Point 002, and not applicable to the Crude Oil Tanks.

- Condition 25 – The construction permit cancels previous versions

  Not Included: This condition is informational and has no specific requirements

- Condition 26 – Requirements to submit revised APENs

  Not included: these requirements are addressed in the general requirements section of the operating permit as applicable

- Condition 27 – Stack height requirements

  Included

- Condition 28 – Requirement to submit operating permit application

  Not Included: One-time requirement has been met

- Condition 29 – relaxation requirement for PSD/NANSR limits

  Not Included: This requirement is evaluated on a case-by-case basis that is dependent on specific parameters of undefined future modifications, and the requirement will be evaluated at that time; the condition is therefore not included.

- Conditions 30 - 36 – The general requirements section of the construction permit

  Not included: these requirements are addressed in the general requirements section of the operating permit as applicable

2. Emission Factors

Emissions from the Crude Oil Tanks shall be calculated on a monthly basis using BR&E's ProMax modelling software. ProMax inputs are based on site specific sampling and analysis, and monitored temperature and pressure data.

3. Monitoring Plan

Crude Oil tank throughput is monitored on a monthly basis. Separator temperature and pressure require weekly monitoring. Annual monitoring is required for compositional sampling of the pre-flash pressurized crude oil and sales oil analysis to determine RVP and API gravity. Semi-annual stack testing is required by the Division to ensure appropriate emission control efficiency.

4. Compliance Status

The Title V permit application indicates that the Crude Oil Tanks are in compliance with all applicable requirements.

B. Flare-1 – Two (2) TCI 4800 Enclosed Combustors for Flaring of Produced Gas from Heater-Treaters (AIRS ID: 002)

1. Applicable Requirements

According to the Title V permit application, the Flare-1 commenced operation on June 23, 2016.

The due date of the first semi-annual monitoring report required by this operating permit will be more than 180 days after the initial approval construction permit 16JA1055 was issued and/or the equipment commenced operation. Therefore, under the provisions of Regulation No. 3, Part C, Section V.A.2, the Division is allowing the initial approval construction permit to continue in full force and effect and will consider the Responsible Official certification submitted with that report to serve as the demonstration required pursuant to Regulation No. 3, Part B, Section III.G.2 and no final approval construction permit will be issued. The appropriate provisions of the initial approval construction permit have been directly incorporated into this operating permit

The appropriate applicable requirements from Colorado Construction Permit 16JA1055 for the Flare-1 are as follows:

- Condition 1 – Self-Certification Requirements

  Not Included: Condition is fulfilled through compliance with Regulation No. 7 requirements.

- Condition 2 – the construction permit issuance represents final approval to operate

  Not Included: this condition is informational and has no specific requirements

- Condition 3 – Emission Limits

Included

- Condition 4 – Requirements to operate/maintain control equipment

  Not included: the operating permit includes more specific requirements for the operation, monitoring and maintenance of all control equipment

- Condition 5 – Process Limits

  Included

- Condition 6 – Requirement to follow Operation & Maintenance Plan for calculating emissions.

  Not Included: Condition is applicable to Points 001 and 003, and not applicable to the Crude Oil Tanks.

- Condition 7 – Requirement to monitor and record heater treater throughput

  Included

- Condition 8 – Loadout submerged fill requirement

  Not Included: Condition is applicable to Point 004, and not applicable to the Crude Oil Tanks.

- Condition 9 – Opacity requirement

  Included: additional language to monitor compliance was also included.

- Condition 10 – Regulation No. 2 odor requirements

  Not included: these requirements are addressed in the general requirements section of the operating permit as applicable

- Condition 11 – mark equipment with identifying info

  Not included: one-time requirement has been met

- Conditions 12 – Colorado Regulation No. 7 requirements for combustion devices

  Included

- Conditions 13 and 14 – Colorado Regulation No. 7 requirements for storage tanks

  Not Included: Condition is applicable to Points 001 and 003, and not applicable to the Crude Oil Tanks

- Condition 15 – Colorado Regulation No. 7 requirements for alternative emissions control devices

Not Included: Condition is applicable to Points 001 and 003, and not applicable to the separators

- Condition 16 – Colorado Regulation No. 7 requirements for well production facilities

  Included

- Condition 17 – Requirement to minimize leaks form loading operations

  Not Included: Condition is applicable to Point 004, and not applicable to the separators

- Condition 18 – Colorado Regulation No. 3 requirements for loading procedures

  Not Included: Condition is applicable to Point 004, and not applicable to the separators

- Condition 19 – Colorado Regulation No. 3 requirements to minimize leakage of VOCs

  Not Included: Condition is applicable to Point 004, and not applicable to the separators

- Condition 20 – Requirement to submit/follow Operating & Maintenance Plan

  Not included: Monitoring and maintenance requirements are incorporated directly in the operating permit

- Condition 21 – Initial Testing Requirement(s) for opacity

  Included: Included in the Regulation No. 7, Section XVII requirements, but not as an initial testing requirement.

- Condition 22 – Periodic Testing Requirement(s) for compliance emission test

  Not Included: Condition is applicable to Points 001 and 003, and not applicable to the separators

- Condition 23 – Periodic Testing Requirement(s) for compliance emission test

  Included

- Condition 24 – Periodic Testing Requirement(s) for gas analysis

  Included

- Condition 25 – The construction permit cancels previous versions

Not Included: This condition is informational and has no specific requirements

- Condition 26 – Requirements to submit revised APENs

  Not included: these requirements are addressed in the general requirements section of the operating permit as applicable

- Condition 27 – Stack height requirements

  Included

- Condition 28 – Requirement to submit operating permit application

  Not Included: One-time requirement has been met

- Condition 29 – relaxation requirement for PSD/NANSR limits

  Not Included: This requirement is evaluated on a case-by-case basis that is dependent on specific parameters of undefined future modifications, and the requirement will be evaluated at that time; the condition is therefore not included.

- Conditions 30 - 36 – The general requirements section of the construction permit

  Not included: these requirements are addressed in the general requirements section of the operating permit as applicable

2. Emission Factors

Emissions from the Flare-1 shall be calculated on a monthly basis using BR&E's ProMax modelling software and emission factors approved by the Division. ProMax inputs are based on site specific sampling and analysis.

3. Monitoring Plan

Natural gas vented to the flare as waste gas is continuously monitored and recorded. Separator temperature and pressure require weekly monitoring. Annual monitoring is required for compositional sampling of the flared natural gas.

4. Compliance Status

The Title V permit application indicates that the Flare-1 is in compliance with all applicable requirements.

C. PW Tanks – Six (6) 1,100 barrel Fixed Roof Storage Vessels used to Store Produced Water (AIRS ID: 003)

1. Applicable Requirements

According to the Title V permit application, the PW Tanks commenced operation on September 19, 2016.

The due date of the first semi-annual monitoring report required by this operating permit will be more than 180 days after the initial approval construction permit 16JA1055 was issued and/or the equipment commenced operation. Therefore, under the provisions of Regulation No. 3, Part C, Section V.A.2, the Division is allowing the initial approval construction permit to continue in full force and effect and will consider the Responsible Official certification submitted with that report to serve as the demonstration required pursuant to Regulation No. 3, Part B, Section III.G.2 and no final approval construction permit will be issued. The appropriate provisions of the initial approval construction permit have been directly incorporated into this operating permit

The appropriate applicable requirements from Colorado Construction Permit 16JA1055 for the PW Tanks are as follows:

- Condition 1 – Self-Certification Requirements

  Not Included: Condition is fulfilled through compliance with Regulation No. 7 requirements.

- Condition 2 – the construction permit issuance represents final approval to operate

  Not Included: this condition is informational and has no specific requirements

- Condition 3 – Emission Limits

  Included

- Condition 4 – Requirements to operate/maintain control equipment

  Not included: the operating permit includes more specific requirements for the operation, monitoring and maintenance of all control equipment

- Condition 5 – Process Limits

  Included

- Condition 6 – Requirement to follow Operation & Maintenance Plan for calculating emissions.

  Not Included: Emission calculation methodology was modified based on monitoring and recordkeeping requirements.

- Condition 7 – Requirement to monitor and record heater treater throughput

  Not Included: Condition is applicable to Point 002, and not applicable to the Produced Water Tanks.

- Condition 8 – Loadout submerged fill requirement

Not Included: Condition is applicable to Point 002, and not applicable to the Produced Water I Tanks.

- Condition 9 – Opacity requirement

  Included: additional language to monitor compliance was also included.

- Condition 10 – Regulation No. 2 odor requirements

  Not included: these requirements are addressed in the general requirements section of the operating permit as applicable

- Condition 11 – mark equipment with identifying info

  Not included: one-time requirement has been met

- Conditions 12 – Colorado Regulation No. 7 requirements for combustion devices

  Included

- Conditions 13 and 14 – Colorado Regulation No. 7 requirements for storage tanks

  Included

- Condition 15 – Colorado Regulation No. 7 requirements for alternative emissions control devices

  Included

- Condition 16 – Colorado Regulation No. 7 requirements for well production facilities

  Not Included: Condition is applicable to Point 002, and not applicable to the Produced Water Tanks.

- Condition 17 – Requirement to minimize leaks form loading operations

  Not Included: Condition is applicable to Point 004, and not applicable to the Produced Water Tanks.

- Condition 18 – Colorado Regulation No. 3 requirements for loading procedures

  Not Included: Condition is applicable to Point 004, and not applicable to the Produced Water Tanks.

- Condition 19 – Colorado Regulation No. 3 requirements to minimize leakage of VOCs

  Not Included: Condition is applicable to Point 004, and not applicable to the Produced Water Tanks.

- Condition 20 – Requirement to submit/follow Operating & Maintenance Plan

  Not included: Monitoring and maintenance requirements are incorporated directly in the operating permit

- Condition 21 – Initial Testing Requirement(s) for opacity

  Included: Included in the Regulation No. 7, Section XVII requirements, but not as an initial testing requirement.

- Condition 22 – Periodic Testing Requirement(s) for compliance emission test

  Included

- Condition 23 – Periodic Testing Requirement(s) for compliance emission test

  Not Included: Condition is applicable to Point 002, and not applicable to the Produced Water Tanks.

- Condition 24 – Periodic Testing Requirement(s) for gas analysis

  Not Included: Condition is applicable to Point 002, and not applicable to the Produced Water Tanks.

- Condition 25 – The construction permit cancels previous versions

  Not Included: This condition is informational and has no specific requirements

- Condition 26 – Requirements to submit revised APENs

  Not included: these requirements are addressed in the general requirements section of the operating permit as applicable

- Condition 27 – Stack height requirements

  Included

- Condition 28 – Requirement to submit operating permit application

  Not Included: One-time requirement has been met

- Condition 29 – relaxation requirement for PSD/NANSR limits

  Not Included: This requirement is evaluated on a case-by-case basis that is dependent on specific parameters of undefined future modifications, and the requirement will be evaluated at that time; the condition is therefore not included.

- Conditions 30 - 36 – The general requirements section of the construction permit

Not included: these requirements are addressed in the general requirements section of the operating permit as applicable

2. Emission Factors

Pollutant	Uncontrolled Emission Factor (lb/bbl)
VOC	0.262
CO	0.0026

The source of the VOC emission factor is APCD *PS Memo 09-02 – Oil & Gas Produced Water Tank Batteries Regulatory Definitions and Permitting Guidance.* The source of the CO emission factor is adapted from EPA's *AP-42, Chapter 13.5 – Industrial Flares*. Note that the VOC emission factor listed above is a state-wide default emission factor. The produced water tanks are a relatively large emission point (over 300 tpy pre-controlled VOC emissions). Typically the title V would require additional monitoring for such a point to establish an emission factor that better represents actual emissions at the specific site. However, in this case, the construction permit also requires on-going semiannual stack testing which should satisfy the Title V requirement that operating permits are required to have sufficient monitoring.

3. Monitoring Plan

The quantity of produced water processed through the tanks shall be monitored using a volumetric flow meter and recorded monthly.

4. Compliance Status

The Title V permit application indicates that the PW Tanks is in compliance with all applicable requirements.

D. Crude Load-out – Truck Loadout of Stored Crude Oil (AIRS ID: 004)

1. Applicable Requirements

According to the Title V permit application, the Crude Load-out commenced operation on September 19, 2016.

The due date of the first semi-annual monitoring report required by this operating permit will be more than 180 days after the initial approval construction permit 16JA1055 was issued and/or the equipment commenced operation. Therefore, under the provisions of Regulation No. 3, Part C, Section V.A.2, the Division is allowing the initial approval construction permit to continue in full force and effect and will consider the Responsible Official certification submitted with that report to serve as the demonstration required pursuant to Regulation No. 3, Part B, Section III.G.2 and no final approval construction permit will be issued. The appropriate provisions of the initial approval construction permit have been directly incorporated into this operating permit

The appropriate applicable requirements from Colorado Construction Permit 16JA1055 for the Crude Load-out are as follows:

- Conditions 1 and 2 – Self-Certification Requirements

  Not Included: Condition is applicable to Points 001, 002, and 003, and not applicable to the loadout operations.

- Condition 3 – Emission Limits

  Included

- Condition 4 – Requirements to operate/maintain control equipment

  Not included: the operating permit includes more specific requirements for the operation, monitoring and maintenance of all control equipment

- Condition 5 – Process Limits

  Included

- Condition 6 – Requirement to follow Operation & Maintenance Plan for calculating emissions.

  Not Included: Condition is applicable to Points 001, and 003, and not applicable to the loadout operations

- Condition 7 – Requirement to monitor and record heater treater throughput

  Not Included: Condition is applicable to Point 002, and not applicable to the loadout operations.

- Condition 8 – Loadout submerged fill requirement

  Not Included: Condition is applicable to Point 002, and not applicable to the loadout operations.

- Condition 9 – Opacity requirement

  Included: additional language to monitor compliance was also included.

- Condition 10 – Regulation No. 2 odor requirements

  Not included: these requirements are addressed in the general requirements section of the operating permit as applicable

- Condition 11 – mark equipment with identifying info

  Not Included: Condition is applicable to Points 001, 002, and 003, and not applicable to the loadout operations

- Conditions 12 – Colorado Regulation No. 7 requirements for combustion devices

Not Included: Condition is applicable to Points 001, 002, and 003, and not applicable to the loadout operations

- Conditions 13 and 14 – Colorado Regulation No. 7 requirements for storage tanks

  Not Included: Condition is applicable to Points 001, and 003, and not applicable to the loadout operations

- Condition 15 – Colorado Regulation No. 7 requirements for alternative emissions control devices

  Not Included: Condition is applicable to Points 001, and 003, and not applicable to the loadout operations

- Condition 16 – Colorado Regulation No. 7 requirements for well production facilities

  Not Included: Condition is applicable to Point 002, and not applicable to the loadout operations.

- Condition 17 – Requirement to minimize leaks form loading operations

  Not Included: Condition paraphrases Regulation No. 7, Section XVII.B.1.a, so owner/operator is directed to comply with that regulation in the operating permit.

- Condition 18 – Colorado Regulation No. 3 requirements for loading procedures

  Included

- Condition 19 – Colorado Regulation No. 3 requirements to minimize leakage of VOCs

  Included

- Condition 20 – Requirement to submit/follow Operating & Maintenance Plan

  Not included: Monitoring and maintenance requirements are incorporated directly in the operating permit

- Condition 21 – Initial Testing Requirement(s) for opacity

  Not Included: Condition is applicable to Points 001, 002, and 003, and not applicable to the loadout operations

- Condition 22 – Periodic Testing Requirement(s) for compliance emission test

  Not Included: Condition is applicable to Points 001, and 003, and not applicable to the loadout operations

- Condition 23 – Periodic Testing Requirement(s) for compliance emission test

  Not Included: Condition is applicable to Point 002, and not applicable to the loadout operations.

- Condition 24 – Periodic Testing Requirement(s) for gas analysis

  Not Included: Condition is applicable to Point 002, and not applicable to the loadout operations.

- Condition 25 – The construction permit cancels previous versions

  Not Included: This condition is informational and has no specific requirements

- Condition 26 – Requirements to submit revised APENs

  Not included: these requirements are addressed in the general requirements section of the operating permit as applicable

- Condition 27 – Stack height requirements

  Included

- Condition 28 – Requirement to submit operating permit application

  Not Included: One-time requirement has been met

- Condition 29 – relaxation requirement for PSD/NANSR limits

  Not Included: This requirement is evaluated on a case-by-case basis that is dependent on specific parameters of undefined future modifications, and the requirement will be evaluated at that time; the condition is therefore not included.

- Conditions 30 - 36 – The general requirements section of the construction permit

  Not included: these requirements are addressed in the general requirements section of the operating permit as applicable

2. Emission Factors

Emissions from the Crude Load-out shall be calculated on a monthly basis using the methodology specified in *AP-42, Chapter 5.2, Transportation and Marketing of Petroleum Liquids (07/2008)*. Emissions will be calculated using 0% control efficiency when vented to atmosphere and 95% when loadout is controlled by the flare.

Control efficiencies are as reported on the APEN and are based on the flare control efficiency of 95% and a collection efficiency of 100%. The permit limit is

based on the applicant's request that up to 50% of all liquids loaded out be uncontrolled.

3. Monitoring Plan

Crude oil tank throughput is monitored on a monthly basis using a flow meter.

4. Compliance Status

The Title V permit application indicates that the Crude Oil Tanks is in compliance with all applicable requirements.

V. Streamlining of Applicable Requirements

Regulation No. 7 Section XVII.C.4 is a state-only enforceable requirement to track monthly condensate production from the tanks; this requirement has been streamlined out in favor of the condensate throughput limit, which also requires monthly throughput records.

VI. Insignificant Activities

General categories of insignificant activities include:

*Each individual piece of fuel burning equipment, other than smokehouse generators and internal combustion engines, that use gaseous fuel, and that has a design rate less than or equal to five million British thermal units per hour (Reg. 3, Part C.II.E.3.k)

*Air pollution emission units, operation or activities with emissions less than the appropriate de minimis reporting level (Reg. 3, Part C.II.E.3.a)

Specific insignificant activities identified in the Title V permit application are:

Two (2) 2 MMBtu/hr separator heaters

Fugitive emissions

VII. Alternative Operating Scenarios

No alternative operating scenarios were requested for this facility.

VIII. Permit Shield

The source requested the permit shield for the following regulations:

- 40 CFR Part 60 Subpart OOOOa - Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015 (related to storage tanks)

The Division has included these requests in the permit, with the following additional notations:

- Regarding NSPS OOOOa: The fugitive components subject to the requirements in OOOOa are not covered by the permit shield. The permit shield is applicable only to the storage tanks on site with potential post-control VOC emissions less than six (6) tons per year.

The source also requested the permit shield for the following regulations:

- Reg 3, Part B, Section III.D.2
- Reg 7, Sections XVII.B.2, XVII.C.1, XVII.C.2, XVII.B.2.e, and XVII.G

The Division did not grant the permit shield for these regulations because the facility is subject to these regulations and the permit shield section of the permit is designed for regulations with negative applicability.

IX. Facility-Wide Emission Details

Point	Facility ID	Description	Controlled Emissions (tpy)					Uncontrolled Emissions (tpy)				
			$PM_{2.5}$	NO_X	VOC	CO	Reportable HAPs	$PM_{2.5}$	NO_X	VOC	CO	Reportable HAPs
001	Crude Oil Tanks	Twenty-five (25) 1,100 bbl atm Crude Oil Tanks		9.3	101.7	42.4	1.2		N/A	6066.7	N/A	79.3
002	Flare-1	Two (2) Enclosed Combustors controlling Heater-Treaters	2.3	20.6	100.7	93.5	3.2	2.3	N/A	5032.3	N/A	158.4
003	PW Tanks	Six (6) 1,100 bbl Produced Water Tanks		4.3	5.1	19.4	0.5			303.5	N/A	33.6
004	Crude Load-out	Crude Oil Truck Loadout			29.6		0.5			56.3		0.9
Total			**2.3**	**34.2**	**237.1**	**155.3**	**5.3**	**2.3**	**N/A**	**11458.8**	**N/A**	**272.2**

Notes: HAP emissions shown above are total Reportable HAPs emissions (i.e., uncontrolled emissions are greater than de minimis Reg 3 Part A reporting thresholds.

Emission Factor Data Sources:

Crude Oil Tanks	NO_X, and CO emission factors are from AP-42 Chapter 13.5. VOC and HAPs emission factors are from ProMax model based on site-specific pressurized liquid analysis. Control efficiencies are as reported on the APEN: 98.5% for VOC and HAPs.
Enclosed Combustors and Heater-Treaters	NO_X, and CO emission factors are from AP-42 Chapter 13.5. PM2.5 emission factors are from AP-42 Chapter 1.4. VOC and HAPs emission factors are from a displacement equation/mass balance using site-specific gas sample. Control efficiencies are as reported on the APEN: 98% for VOC and HAPs.
Produced Water Tanks	CO emission factors are from AP-42 Chapter 13.5. VOC and HAP emission factors are from CDPHE State Default Emission Factors, PS Memo 09-02. Control efficiencies are as reported on the APEN: 98.5% for VOC and HAPs.
Crude Oil Loadout	VOC and HAP emission factors are from CDPHE State Default Emission Factors, PS Memo 14-02. Control efficiencies are as reported on the APEN and are based on the flare control efficiency of 95% and a collection efficiency of 100%. The permit limit is based on the applicant's request that up to 50% of all liquids loaded out be uncontrolled.

HAP Emission Details:

Controlled Emissions (lb/year)

Point	Facility ID	Benzene	Toluene	Ethylbenzene	Xylenes	n-Hexane	2,2,4-TMP	Total (tpy)	Total Reportable (tpy)
001	Crude Oil Tanks	*198*	*151*	*26*	*60*	*1915*	*31*	1.2	1.2
002	Flare-1	*415*	*596*	*147*	*147.2*	*4482*	*132*	3.0	3.2
003	PW Tanks	*243*				*765*		0.5	0.5
004	Crude Load-out	103				*909*		0.5	0.5
Total		**958**	**747**	**173**	**624**	**8071**	**163**	**5.2**	**5.1**

Uncontrolled Emissions (lb/year)

Point	Facility ID	Benzene	Toluene	Ethylbenzene	Xylenes	n-Hexane	2,2,4-TMP	Total (tpy)	Total Reportable (tpy)
001	Crude Oil Tanks	*13181*	*10045*	*1710*	*4005*	*127662*	*2078*	79.3	79.3
002	Flare-1	*20765*	*29819*	*7362*	*28221*	*224091*	*6601*	158.4	158.4
003	PW Tanks	*16219*				*50973*		33.6	33.6
004	Crude Load-out	196				*1732*		1.0	0.9
Total		**50361**	**39863**	**9070**	**32221**	**404462**	**8675**	**272.3**	**272.2**